

follower, Henry Winthrop Sargent, brought out a sixth edition of the same work with a supplement describing Wodenethe, his own estate on the Hudson, and also the estate of this relative, Horatio Hollis Hunnewell, of Wellesley, Massachusetts.<sup>8</sup>

It was Henry W. Sargent who first kindled the interest of both Hunnewell and his younger relative, Charles Sprague Sargent, in horticulture and landscape gardening.<sup>9</sup> Thus of the men who played major roles in the institutional rearrangements of Harvard in 1872 out of which the Arnold Arboretum grew, three—Gray, Hunnewell, and C. S. Sargent—had long acquaintance with the tradition stemming from the work of Downing. Frederick Law Olmsted, an old friend of Gray's and the co-worker with C. S. Sargent in laying out the Arnold Arboretum, also owed much to the influence of Downing. Hence the founders of the Arboretum in the 1870's had the benefit of a horticultural tradition, of which they were a part, going back thirty years to New York state and Andrew Jackson Downing, and the collaboration of the two co-editors of the American edition of Lindley's *Theory of Horticulture* bore fruit after many seasons.—UNIVERSITY OF CALIFORNIA, BERKELEY.

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## ADDITIONS TO THE FLORA OF ST. PAUL ISLAND, NOVA SCOTIA

J. S. ERSKINE

ST. PAUL ISLAND is the northernmost point of Nova Scotia, a cliffbound island three and one-quarter miles long by never more than one mile wide. The vascular flora was first listed by Dr. A. H. MacKay in 1883. Then in 1929 Miss L. M. Perry and Dr. Muriel Roscoe spent a month on the island and collected exhaustively the vascular plants and the algae, lists of which appeared in *Rhodora* in May, 1931. The present author spent from August 10th to 17th on the island, collecting plants for the Nova Scotia Museum of Science. Miss Perry's lists and floristic descriptions are still valid today, although

<sup>8</sup> See C. S. SARGENT, "Henry Winthrop Sargent," L. H. Bailey, ed., *Standard Cyclopaedia of Horticulture* (N. Y., 1915), III, 1594.

<sup>9</sup> E. W. SARGENT and C. S. SARGENT, eds., *Epes Sargent of Gloucester and his Descendants* (Boston, 1923), 193.

many of her plant-names have been changed and some varieties discarded. As all these alterations can be traced through Gray's *Manual of Botany*, 8th Edition, I have not thought it worthy of space to comment upon them and I offer this list merely as a supplement to hers. When new varietal refinements have seemed of interest, I have included them in my list. The vascular collections have been checked completely by D. S. Erskine in the N. S. Museum, and in part by others, and I have accepted their determinations when their judgement has disagreed with mine. The chief differences between Miss Perry's list and mine, apart from the fluctuating element of introduced and often impermanent weeds, suggest that she combed the bare headlands more thoroughly, I the woods and bogs. Her list showed 280 species and 17 still accepted varieties, mine 290 species and 6 varieties, the combined total being 320 species thus far known for the island.

#### ADDITIONS TO MISS PERRY'S LIST

1. *Lycopodium complanatum* L., var. *flabelliforme* Fern. One station, Atlantic Cove by path to Big Lake.
2. *Picea mariana* (Mill.) BSP. Many stunted trees in bogs.
3. *Potamogeton confervoides* Reichenb. Sterile in Little Lake.
4. *Festuca elatior* L. Scarce weed by road to Southwest.
5. *Poa annua* L. Clumps around barn, Southwest.
6. *Poa palustris* L. Headland, Southwest.
7. *Agropyron repens* (L.) Beauv., var. *subulatum* (Schreb.) Reichenb., f. *Vaillantianum* (Wulf. & Schreb.) Fern. Garden, Atlantic Cove.
8. *Agropyron trachycaulum* (Link.) Malte, var. *novae-angliae* (Scribn.) Fern. Headlands, Atlantic Cove & Petrie's Point.
9. *Hordeum jubatum* L. Salty hilltop, Northeast.
10. *Elymus mollis* Trin. Headland, Martin Power's Cove.
11. *Agrostis scabra* Willd. Roadside to Southwest.
12. *Agrostis tenuis* Sibth. Wood-edge, Atlantic Cove.
13. *Hierochloe odorata* (L.) Wahl. Boggy slope, Trinity Cove.
14. *Eleocharis halophila* Fern. Brackish pool on NE Head.
15. *Eleocharis Smallii* Britt. Edge of Little Lake. Probably Miss Perry's *E. palustris* was this alone and not 14.
16. *Eriophorum spissum* Fern. Occasional in bog, Petrie's Pond.
17. *Carex cephalantha* (Bailey) Bickn. Swamp by path to Northeast.
18. *Carex leptalea* Wahl. Wood near Little Lake.
19. *Carex novae-angliae* Schwein. Wood, Atlantic Cove.
20. *Carex salina* Wahl. ( $\times$  *C. paleacea* Wahl. ?DSE)
21. *Carex pallescens* L., var. *neo-gaea* Fern. Petrie's Pond.

22. *Carex oligosperma* Mx. Frequent in high bogs, Coggin's Mtn.
23. *Juncus pelocarpus* Mey. Floating in bog-pool, SW Head.
24. *Smilacina trifolia* (L.) Desf. Frequent in bog-holes.
25. *Habenaria Hookeri* Torr. Wood, Atlantic Cove.
26. *Habenaria blephariglottis* (Willd.) Torr. Common on high bogs, Coggin's Mtn.
27. *Goodyera repens* (L.) R. Br., var. *ophioides* Fern. In woods, Norwegian Mtn., Coggin's Mtn., SW Head.
28. *Salix Bebbiana* Sarg. Three sterile shrubs from scattered stations.
29. *Myrica Gale* L. Common around bog-holes.
30. *Betula lutea* Mx. f. Rare shrubs with unusual leaves.
31. *Betula papyrifera* Marsh., var. *commutata* (Regel) Fern. and var. *macrostachya* Fern. The species was reported by Miss Perry. These varieties are recognizable among a jumble of variants.
32. *Betula borealis* Spach. In alder scrub by path to NE and on high bogs, Coggin's Mtn.
33. *Betula pumila* L., var. *renifolia* Fern. Found by Miss Perry and later segregated to this variety.
34. *Rumex domesticus* Hartm. Hen-run, Atlantic Cove.
35. *Cerastium arvense* L., var. *viscidulum* Greml. Found by Miss Perry and now segregated into this variety.
36. *Neslia paniculata* (L.) Desv. Hen-run, Atlantic Cove.
37. *Drosera intermedia* Hayne. Common around edge of bog-holes.
38. *Pyrus americana* Marsh. Miss Perry found only *P. decora*, but my collections were nearer to *P. americana*.
39. *Prunus virginiana* L. Occasional in wood, Atlantic Cove; forming scrubby woods west of Big Lake.
40. *Vicia Cracca* L. Rare weed, Atlantic Cove.
41. *Hypericum perforatum* L. Beside road to Southwest.
42. *Oenothera biennis* L. Spreading weed, Atlantic Cove.
43. *Sanicula marilandica* L. Wood west of Big Lake.
44. *Coelopleurum lucidum* (L.) Fern. Headland, Martin Power's Cove.
45. *Cornus* × *unalaschkensis* Ledeb. Reported but not collected by Miss Perry. Fairly frequent.
46. *Cornus alternifolia* L. f. Wood near Little Lake.
47. *Monotropa Hypopitys* L. One patch on Coggin's Mtn.
48. *Bartonia paniculata* (Mx.) Muhl., var. *sabulonensis* St. J. & Fern. Not uncommon in bog, Petrie's Pond & Coggin's Mtn.
49. *Lappula echinata* Gilib. By barn, Southwest.
50. *Achillea Millefolium* L. was found by Miss Perry, but my specimens have been corrected to *A. lanulosa* Nutt.
51. *Matricaria maritima* L. By barn, Southwest.
52. *Sonchus arvensis* L. Headland, Northeast.
53. *Sonchus asper* (L.) Hill. Roadside to Southwest.
54. *Lactuca biennis* (Moench.) Fern. Occasional in east woods.
55. *Hieracium aurantiacum* L. One plant, Atlantic Cove.
56. *Hieracium canadense* Mx. Established by road to Southwest.

The bryophytes of St. Paul Island have not previously been listed. The island, with its woods, bogs and raw headlands, is a better habitat for mosses than for vascular plants, yet only one species of moss to six of vascular plants was collected as compared to one to four on the mainland. This list, therefore, cannot claim to be exhaustive. The more difficult mosses and hepatics were checked by Dr. A. L. Andrews of Ithaca, N. Y., the sphagna by Dr. H. L. Blomquist of Duke University, and my thanks are due to both of them. Twenty species of lichens were collected also, but, as these have not been checked by an authority and as they do not differ appreciably from those of the Cape Breton barrens, the names are not listed here.

## HEPATICES

- Barbilophozia barbata* (Schmid.) Loeske. 2417, Atlantic Cove.  
*Bazzania trilobata* (L.) S. F. Gray. 2411, Woods, Little Lake.  
*Blasia pusilla* L. 2360, 2436. SW Head, Norwegian Mtn.  
*Blepharostoma trichophyllum* (L.) Dum. 2375, path to NE.  
*Calypogeia Neesiana* (M. & C.) K. Mull. 2415, Atlantic Cove.  
*Calypogeia Trichomanis* (L.) Corda. 2360, Southwest Head.  
*Cephalozia bicuspidata* (L.) Dum. 2436, Norwegian Mtn.  
*Cephalozia connivens* (Dicks.) Lindb. 2436, Norwegian Mtn.  
*Cephalozia leucantha* Spruce. 2436, Norwegian Mtn.  
*Cephaloziella hampeana* (Nees) Schiffn. 2438, Path to NE.  
*Harpanthus scutatus* (Web. & Mohr) Spruce. 2460, Southwest Head.  
*Lepidozia reptans* (L.) Dum. 2416, Atlantic Cove.  
*Lophozia grandiretis* (Kaal) Schiffn. Southwest Head.  
*Scapania irrigua* (Nees) Dumort. 2418, 2459, SW Head, Atlantic Cove.

## MOSSES

- Aulacomnium palustre* (Web. & Mohr) Schwaegr. 2368, South Shore.  
*Amblystegium compactum* (C. Müll.) Aust. 2420, woods, SW Head.  
*Atrichum undulatum* (Hedw.) Beauv. 2427, Norwegian Mtn.  
*Brachythecium salebrosum* (Web. & Mohr) Bry. Eur. 2372, 2379, swampy woods, South Shore.  
*Bryum pallens* (Web. & Mohr) Brid. 2380, wet rocks, path to NE.  
*Ceratodon purpureus* (Hedw.) Brid. 2351, 2358, 2400, 2425. Outcrops, Norwegian Mtn., SW Head, Atlantic Cove.  
*Dicranella heteromalla* (Hedw.) Schimp. Humus in wood, SW Head.  
*Dicranella subulata* (Hedw.) Schimp. 2394, path to NE.  
*Dicranum Bergeri* Blan. 2398, 2450. Atlantic Cove, Coggin's Mtn.  
*Dicranum Bonjeani* DeNot. Humus in wood, SW Head.  
*Dicranum Drummondii* C. Müll. 2354, 2379, 2445. Humus in wood, Norwegian Mtn.; SW Shore; slope by Petrie's Pond.  
*Dicranum scoparium* Hedw. 2392, 2408, 2413, 2420, 2448. Woods, Path to NE, Little Lake, Trinity Cove, Coggin's Mtn.

- Drepanocladus fluitans* (Hedw.) Warnst. 2422, 2426. Bog, SW Head, Norwegian Mtn.
- Drepanocladus revolvens* (Sw.) Warnst. 2378, Bog by path to NE.
- Fontinalis novae-angliae* Sull. 2406, in Little Lake.
- Grimmia maritima* Turn. 2431, rocks, Trinity Cove.
- Hylocomium splendens* Hedw. 2412, rare, woods by Little Lake.
- Hypnum pallescens* (Hedw.) Bry. Eur. 2353, tree bole, Norwegian Mtn.
- Leptodictyum riparium* (Hedw.) Warnst. 2390, bog-pool, SW Head.
- Mnium hornum* Hedw. 2364, 2370, 2356. Rocks, SW Head.
- Mnium punctatum* Hedw. 2414, 2451. Atlantic Cove, Coggin's Mtn.
- Pohlia nutans* (Hedw.) Lindb. 2377, 2397, 2444. Common.
- Plagiothecium striatellum* (Brid.) Lindb. 2383, Rock talus, SW Head.
- Pleurozium Schreberi* (Brid.) Mitt. 2407, by Little Lake, rare.
- Polytrichum gracile* Smith. 2409, woods by Little Lake, rare.
- Polytrichum juniperium* Hedw. 2388, 2446, Bog, SW; path, NE.
- Rhytidiadelphus squarrosus* (Hedw.) Warnst. 2387, 2410, Little Lake, SW Head.
- Sphagnum capillaceum* (Weiss.) Schrank., var. *tenellum* (Schimp.) Andrews. 2447, Coggin's Mtn.
- Sphagnum centrale* C. Jens. 2424, Big Lake. det. A. L. Andrews.
- Sphagnum compactum* DC. 2366, SW Head.
- Sphagnum cuspidatum* Ehrh. 2391, SW Head.
- Sphagnum fimbriatum* Wils. 2369, boggy SW shore.
- Sphagnum fuscum* (Schimp.) H. Klingr. 2395, 2449. Bogs.
- Sphagnum Girgensohnii* Russ. 2374, wet woods, South Shore.
- Sphagnum imbricatum* Hornsch. 2384, SW Head.
- Sphagnum Lindbergii* Schimp. 2381, Big Lake.
- Sphagnum magellanicum* Brid. 2428, Norwegian Mtn.
- Sphagnum papillosum* Lindb. 2365, SW Head.
- Sphagnum recurvum* Beauv. 2419, 2429. Atlantic Cove; Norwegian Mtn.
- Sphagnum riparium* Angst. 2389, SW Head.
- Sphagnum squarrosus* Crome. Wood, SW Head.
- Sphagnum tenellum* Pers. 2386, SW Head.
- Sphagnum Warnstorffii* Russ. 2396, bog by path to NE.
- Tetraphis pellucida* Hedw. 2435, Norwegian Mtn.
- Ulota crispa* (Hedw.) Brid. 2352, tree-trunk, Norwegian Mtn.
- Ulota phyllantha* Brid. 2434, Norwegian Mtn.

Of these only two are new Nova Scotian records. *Sphagnum riparium* Angst. is to be expected here but has not hitherto been reported. *Sphagnum centrale* C. Jens. has not usually been found near the coasts but is otherwise within its expected range. Dr. Andrews said that this specimen lacked the usual robustness of this species.

I have to give grateful acknowledgement of assistance to the Nova Scotia Museum of Science for financing the expedition, to Dr. Andrews and Dr. Blomquist for determinations, and to Miss Perry for having provided an excellent list to build on.—WOLFVILLE, NOVA SCOTIA.